

1.1 lines, increments

Increments

a. How can you drag point P or Q so that only Δx changes?

horizontally

b. How can you drag point P or Q so that only Δy changes?

vertically

c. What are Δx and Δy ?

$$\Delta x = \text{change in } x = x_2 - x_1$$

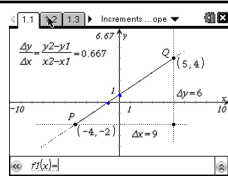
$$\Delta y = \text{change in } y = y_2 - y_1$$

d. What is the equation of the line through P and Q?

$$y = \frac{2}{3}x + \frac{2}{3} \quad y + 2 = \frac{2}{3}(x + 4)$$

$$y = \frac{2}{3}x + b \quad y = \frac{2}{3}(x + 4) - 2$$

$$4 = \frac{2}{3} \cdot 5 + b$$



Aug 21-10:43 AM

Definitions

$$\text{Slope } m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Point-Slope Equation

$$y - y_1 = m(x - x_1)$$

Slope-Intercept Equation

$$y = mx + b$$

General Linear Equation

$$ax + by = c$$

Slopes of Parallel & Perpendicular lines

If $l_1 \parallel l_2$ then $m_1 = m_2$; If $l_1 \perp l_2$ then $m_1 = -\frac{1}{m_2}$

horizontal and vertical lines

$$m = 0$$

$$m = \text{undefined}$$

$$\sum m_1 \cdot m_2 = -1$$

Aug 21-10:55 AM

Write the point-slope equation for the line through $(-2, -1)$ and $(3, 4)$

$$m = \frac{4 - (-1)}{3 - (-2)} = \frac{5}{5} = 1$$

$$y = 1 \cdot (x + 2) - 1$$

$$y = x + 1$$

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Write an equation for the line through the point $(-1, 2)$ that is (a) parallel, and (b) perpendicular to the line $L: y = 3x - 4$

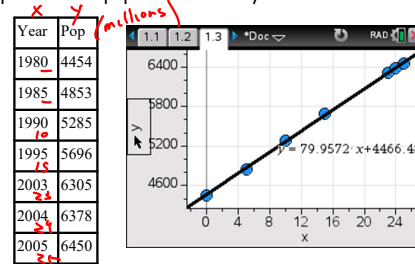
a) $y = 3(x + 1) + 2$ $y = 3x + 5$

b) $y = -\frac{1}{3}(x + 1) + 2$ ~~$y = -\frac{1}{3}x + 5$~~

Aug 21-11:12 AM

Find the relationship between Fahrenheit and Celsius temperature. Then find the Celsius equivalent of 90 degrees Fahrenheit and the Fahrenheit equivalent of -5 degrees Celsius

Regression: Starting with the data in the table, build a linear model for the growth of world population. Use the model to predict the population in the year 2010.



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